ONTARIO MINISTRY OF ENVIRONMENT
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OPERATING SUMMARY

BURLINGTON

Skyway

water pollution control plant

1968

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WATER
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ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

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1968

Burlington Skyway : water pollution control plant.

81237

Water management in Ontario

Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 7
Ontario

We are pleased to present you with the Operating Summary for the water pollution control facilities operated for you during 1968.

Both the financial and technical information presented should be of assistance to your present and future planning in this important phase of municipal activity.

A new format has been devised to allow greater readability with equally detailed content. We trust that this will meet with your approval.

Our staff wish to express their appreciation for your co-operation throughout the year.

DS Caverly

D. S. Caverly,
General Manager.

DMcTavish

D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

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135 St. Clair Avenue West,
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BURLINGTON SKYWAY
water pollution control plant

operated for

THE TOWN OF BURLINGTON

by the

ONTARIO WATER RESOURCES COMMISSION

1968 ANNUAL OPERATING SUMMARY

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125 Resources Rd.
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FOREWORD

● This operating summary outlines the project's technical capabilities and financial status in 1968. Such information mirrors past and present performance, but a major intention is to anticipate the future -- to solve problems before they occur.

The new format in which this year's data are presented is designed to offer a higher level of readability than in the past, without a corresponding decrease in compactness, accuracy and detail.

Although your Regional Operations Engineer carries the major responsibility for the contents of the report, those involved in its preparation are attached to several Commission sections and divisions. The statistics section of the Division of Plant Operations compiled the information for the graphs and charts. The draughting section of the Division of Sanitary Engineering drew the graphs. The Division of Finance provided all cost data.

Only the close co-operation of these departments allowed the publication of this summary.

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'68 REVIEW

FLOWS

The 1968 operating costs for the Burlington Skyway plant were $69,386.01, or $50.82 per million gallons treated. The increase in operating costs over 1967 was 11 percent.

A total of 1,365.20 million gallons of raw sewage was treated in 1968 which is a four percent decrease from 1967.

The plant efficiency was generally excellent, with average effluent qualities meeting OWRC objectives. Raw sewage strengths increased in 1968 averaging 128 mg/l BOD and 161 mg/l suspended solids, compared to 101 mg/l BOD and 160 mg/l suspended solids in 1967.

A program of diffuser replacement was begun in 1968 to eliminate frequent blockages and subsequent lessening of plant efficiency.

PLANT EXPANSION

The plant expansion will include two additional final clarifiers, additional raw sewage and return sludge pumps, and an additional air blower. In addition, portions of the existing plant equipment will be modified to increase its capacity. In total the expansion will increase plant capacity to six mgd from three mgd. During the expansion repairs to the grit building brickwork will also be carried out.

INDUSTRIAL WASTES

Industrial wastes interfered with plant operations on several occasions during 1968. In particular tall oil wastes necessitated extensive in-plant cleaning whenever such wastes were received. The Town of Burlington has been most cooperative in enforcing its industrial waste bylaw in order to eliminate such discharges.

PROJECT COSTS

NET CAPITAL COST (Final)	$1,796,844.53
DEDUCT - Portion Financed by CMHC-MDLB (Final)	1,240.059.57
Long Term Debt to OWRC	$ 556,784.96

Debt Retirement Balance at Credit (Sinking Fund) December 31, 1968	$ 128,615.90

Net Operating	$ 69,386.01
Debt Retirement	20,200.00
Reserve	10,219.19
Interest Charged	31,259.83
TOTAL	$ 131,065.03

RESERVE ACCOUNT

Balance at January 1, 1968	$ 59,226.21
Deposited by Municipality	10,219.19
Interest Earned	3,732.79
	$ 73 178.19
Less Expenditures	9,501.00
Balance at December 31, 1968	$ 63,677.19

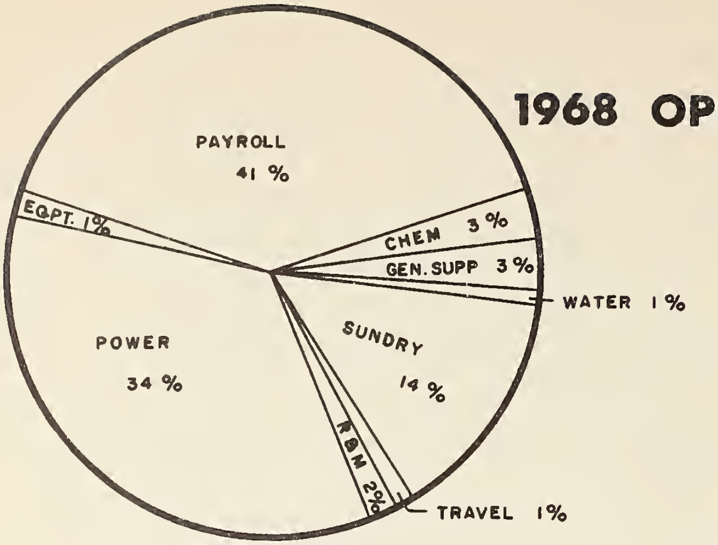
Monthly Operating Costs

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	* SUNDRY	WATER	TRAVEL
JAN	3646.92	1683.83	-	-	1719.28	-	83.65	14.73	-	26.56	118.87	-
FEB	6338.36	1836.15	58.80	-	2360.57	-	110.53	1118.60	389.70	370.58	30.15	63.28
MAR	6523.50	3248.13	-	-	2157.32	-	111.06		132.31	787.13	30.15	57.40
APRIL	7132.48	2030.86	-	-	1984.68	1711.50	111.78	18.22	622.39	603.16	39.15	19.74
MAY	5012.70	2050.66	-	-	1912.98	184.46	128.43	27.27	132.33	546.42	30.15	-
JUNE	3184.30	2100.01	84.00	-	2021.60	166.77	80.21	(1114.70)	(982.04)	777.38	36.79	14.28
JULY	5497.23	1927.48	319.20	-	1845.31	-	193.51		197.79	780.82	38.12	195.00
AUG	3442.39	2225.27	326.25	-	-	-	66.45		59.59	757.83	-	7.00
SEPT	6852.19	2130.90	-	-	3270.32	-	347.65	240.75	2.96	711.25	69.03	79.33
OCT	2917.26	1996.48	-	-	-	-	374.96	12.00	101.42	343.76	-	88.64
NOV	10283.61	2872.81	-	-	3850.12	-	242.05	530.40	315.46	2274.17	60.30	138.30
DEC	8555.07	3715.71	-	-	2157.19	-	336.31	155.70	229.76	1866.59	30.15	63.66
TOTAL	69386.01	27818.29	788.25	-	23279.37	2062.73	2186.59	1002.97	1201.67	9845.65	473.86	726.63

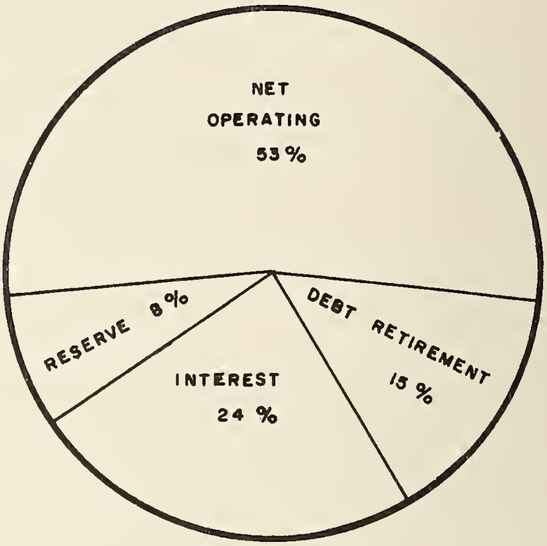
*SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE $7,446.90

BRACKETS INDICATE CREDIT

1968 OPERATING COSTS



TOTAL ANNUAL COST



Yearly Operating Costs

YEAR	M.G.TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER LB OF BOD REMOVED
1964	271.01	$43,402.99	$160.15	8 cents
1965	965.29	51,736.82	53.60	3 cents
1966	1011.46	59,744.34	59.07	3 cents
1967	1419.27	64,725.24	45.60	5 cents
1968	1365.20	69,386.01	50.82	4 cents

Process Data

A total of 1,365.20 million gallons of raw sewage were treated in 1968. This represents a decrease of four percent over 1967. The average daily flow was 3.70 mg. The design flow rate of 3.13 mgd was exceeded 93 percent of the time in 1968, compared with 80 percent in 1967.

The maximum flow for one month occurred in December with a total flow of 129.1 mg and an average daily flow of 5.78 mg. The minimum flow for one month occurred in January with a total flow of 96.8 mg and an average daily flow of 3.12 mg.

The following graphs and tables indicate the monthly fluctuations and yearly trends in flows to the plant.

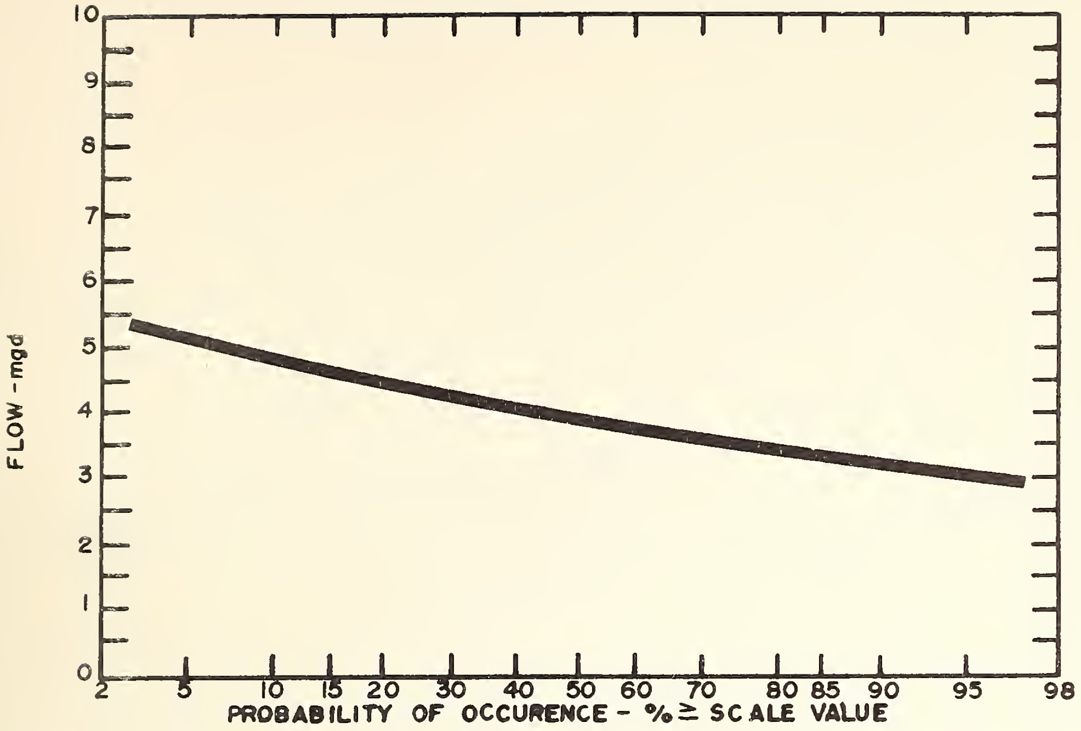
PLANT FLOWS and CHLORINATION

MONTH	TOTAL FLOW mg	AVERAGE DAILY FLOW mg	MAXIMUM DAILY FLOW mg	MINIMUM DAILY FLOW mg	CHLORINE USED 10^3 lbs.	DOSAGE mg/l
JAN	96.8	3.12	5.13	2.20	0	0
FEB	105.9	3.65	4.43	2.90	0	0
MAR	128.8	4.16	4.73	2.55	0	0
APR	100.2	3.34	5.24	3.17	9	9
MAY	122.0	3.93	4.76	3.16	2.81	4.5
JUN	117.2	3.91	4.45	2.95	3.35	2.9
JUL	114.5	3.69	4.31	2.63	4.28	3.7
AUG	107.8	3.48	4.42	2.34	2.88	2.7
SEPT	125.3	4.18	4.63	3.27	3.32	2.6
OCT	107.0	3.45	4.05	2.85	.96	1.9
NOV	110.6	3.69	5.54	2.45	0	0
DEC	129.1	4.16	5.78	2.40	0	0
TOTAL	1365.2	-	-	-	17.60	-
AVERAGE	-	3.70	-	-	2.93*	2.5*

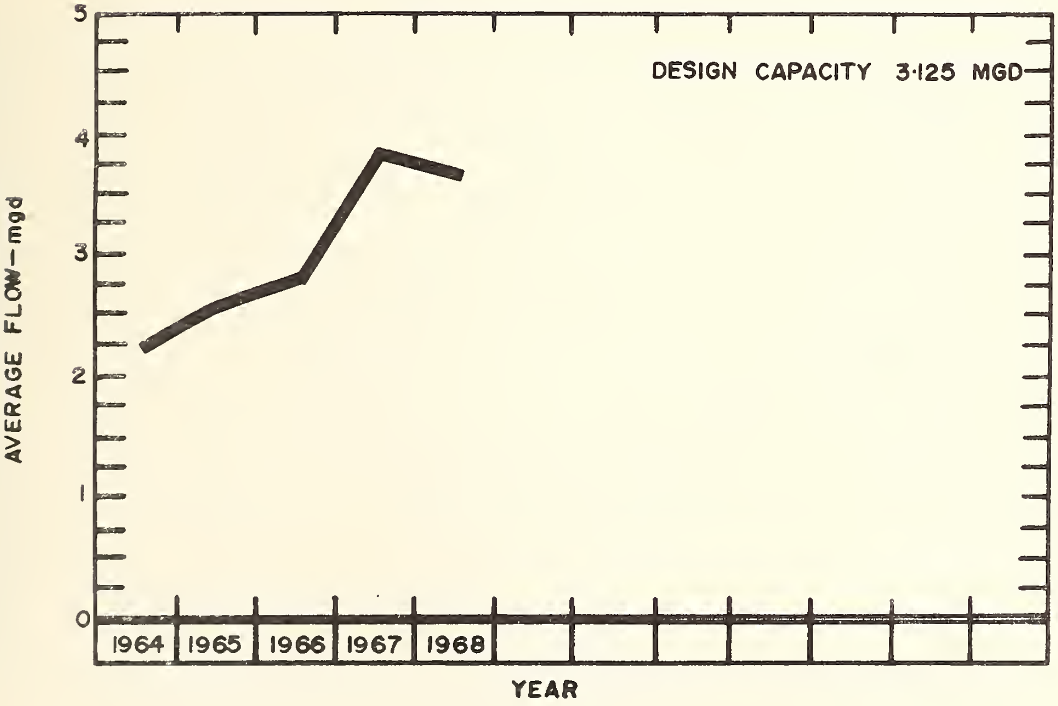
* During chlorination period.

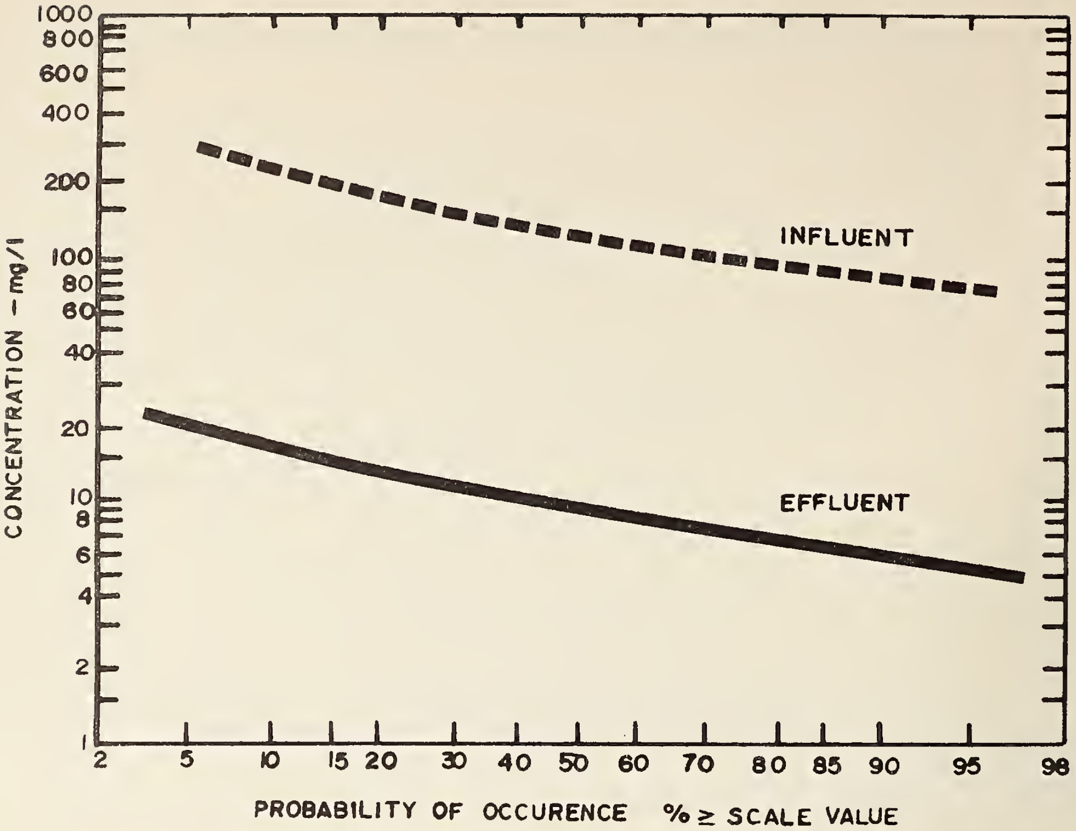
COMMENTS

The final effluent is chlorinated for disinfection purposes between May 15 and November 1. An average dosage rate of 2.5 mg/l was required to maintain a residual of 0.5 mg/l.

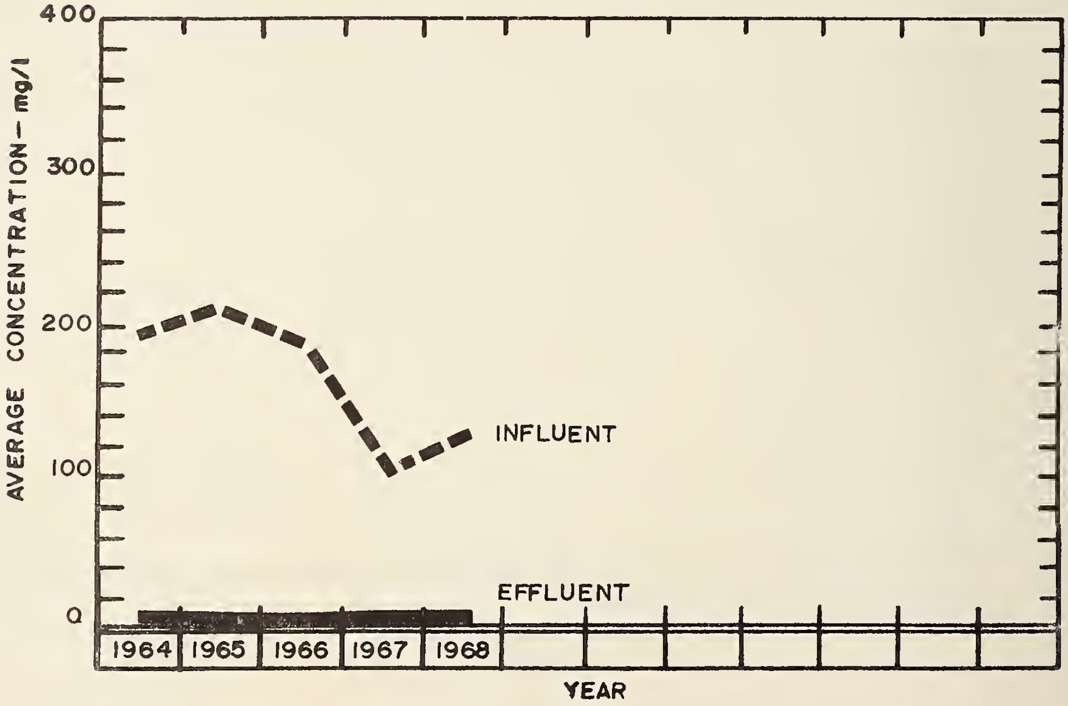

FLOW - mgd
0
1
2
3
4
5
6
7
8
9
10
2
5
10
15
20
30
40
50
60
70
80
85
90
95
98
PROBABILITY OF OCCURENCE - % ≥ SCALE VALUE

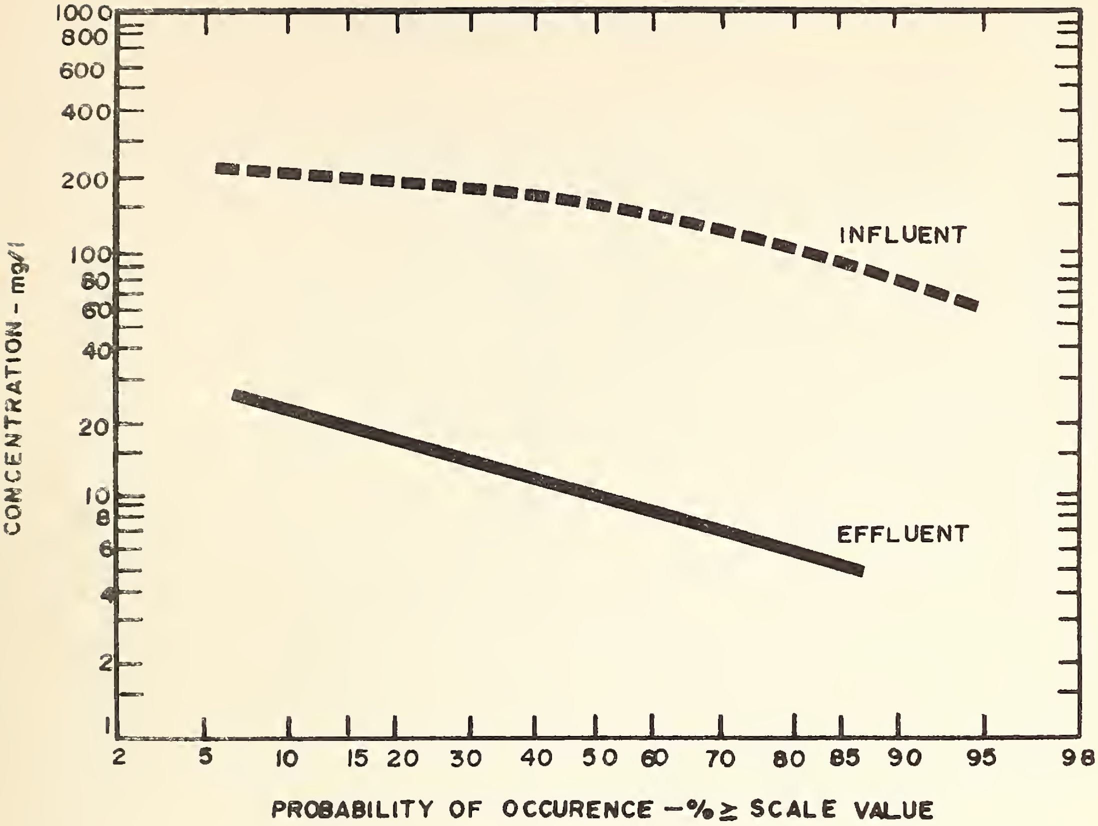
FLOWS


AVERAGE FLOW-mgd
0
1
2
3
4
5
DESIGN CAPACITY 3·125 MGD
1964
1965
1966
1967
1968
YEAR

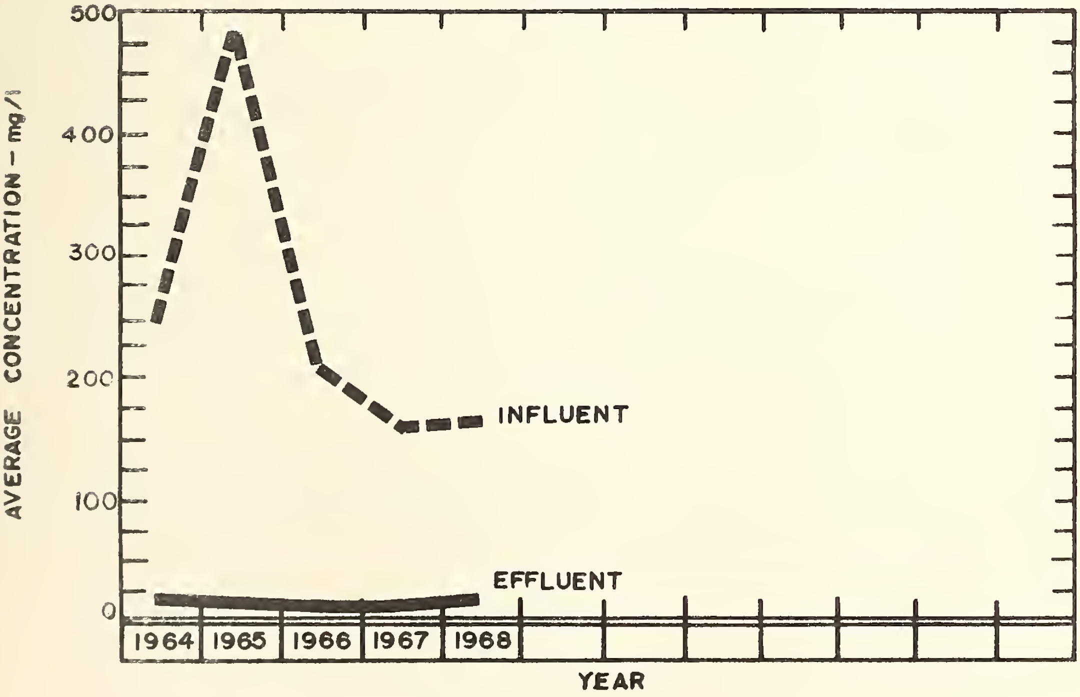


BIOCHEMICAL OXYGEN DEMAND





SUSPENDED SOLIDS



PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				GRIT
	INF CONC^N mg/l	EFF CONC^N mg/l	RED^N %	REMOVAL 10^5 lb	INF CONC^N mg/l	EFF CONC^N mg/l	RED^N %	REMOVAL 10^5 lb	REMOVAL ft^3
JAN	288	6	98	2.24	715	4	99	6.89	200
FEB	71	7	91	.68	88	14	84	.78	135
MAR	122	15	88	1.38	85	20	76	.84	190
APR	190	8	96	1.82	156	9	94	1.47	240
MAY	172	13	92	1.93	122	52	57	.85	180
JUN	118	10	92	1.26	127	7	94	1.41	80
JULY	62	9	86	.61	122	12	90	1.26	410
AUG	87	8	91	.86	63	14	78	.53	660
SEPT	105	7	93	1.23	115	6	95	1.37	110
OCT	95	7	93	.94	103	6	94	1.04	190
NOV	120	6	95	1.26	125	3	98	1.35	530
DEC	104	10	90	1.21	105	9	91	1.24	560
TOTAL	-	-	-	15.42	-	-	-	19.03	3485
AVERAGE	128	9	93	1.29	161	13	92	1.59	290

COMMENTS

The average 1968 effluent BOD quality of nine mg/l remained relatively unchanged from 1967, although the average raw sewage strength increased from an average of 101 mg/l BOD in 1967 to 128 mg/l BOD in 1968. The average 1968 effluent suspended solids quality was 13 mg/l, an increase from nine mg/l in 1967.

Treatment during 1968 was within OWRC objectives when considering the yearly average. The overall plant removal efficiency was slightly above that normally expected of an extended aeration plant.

A total of 3,485 cubic feet of grit was removed in 1968, a decrease of 19 percent from 1967.

SLUDGE DISPOSAL

Month	Liquid (yd^3)	Month	Liquid (yd^3)
January	380	July	864
February	702	August	833
March	705	September	673
April	549	October	740
May	591	November	740
June	528	December	678
		Total	7983
		Average	665
Dewatered (yd^3)		Total	0

COMMENTS

A total of 7,983 cu. yd. of waste activated sludge was removed from the sludge holding tank. This represented an increase over 1967 proportional to the increased organic loading in 1968.

AERATION

MONTH	AVERAGE FLOW mgd	INFLUENT		SECONDARY EFF		MLSS CONCN mg/l	F/M $\left(\frac{\text{lb BOD}}{\text{lb MLSS}}\right)$	AIR USED $\left(\frac{\text{1000 ft}}{\text{lb BOD}}\right)$ REMOVED	WASTE SLUDGE 10^6 lb
		BOD CONCN mg/l	SS CONCN mg/l	BOD CONCN mg/l	SS CONCN mg/l				
JAN	3.12	288	715	6	4	3,750	.07	1.21	-
FEB	3.65	71	88	7	14	4200	.02	3.67	-
MAR	4.16	122	85	15	20	3,770	.04	1.64	-
APRIL	3.34	190	156	8	9	3,020	.06	1.38	-
MAY	3.93	172	122	13	52	3,180	.06	1.14	-
JUN	3.91	118	127	10	7	3,340	.04	1.49	-
JUL	3.69	62	122	9	12	3,510	.02	3.25	-
AUG	3.48	87	63	8	14	4,850	.01	2.50	-
SEPT	4.18	105	115	7	6	5,210	.02	1.65	-
OCT	3.45	95	103	7	6	4,810	.02	2.28	2.8
NOV	3.69	120	125	6	3	3,070	.03	1.73	-
DEC	4.16	104	105	10	9	3,490	.05	2.64	-
TOTAL	-	-	-	-	-	-	-	-	-
AVERAGE	3.70	128	161	9	13	3,930	.04	2.05	2.8

CONCLUSIONS

The plant produced a satisfactory effluent in 1968, although the hydraulic loading exceeded the design loading for much of the year. However, it is anticipated that a plant expansi

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